



STUDIES IN AUSTRALIAN NEUROPTERA.

NO. II. DESCRIPTIONS OF NEW GENERA AND SPECIES OF THE
FAMILIES *OSMYLIDÆ*, *MYRMELEONTIDÆ*, AND *ASCALAPHIDÆ*.

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(Plates i.-vi., and three Text-figs.)

The material on which this paper is based is mainly drawn from my own collection, but has been gathered together by the kindness and energy of many correspondents rather than by myself. These larger Neuroptera are not generally to be taken in any numbers, as are the Odonata; and the gathering together of the material necessary for their study must be spread over a large number of years and carried on by a number of collectors. Particularly must this be so when, as in the case of the *Myrmeleontidæ*, the majority of species are not to be found in the well-watered coastal regions, but are confined to the more arid regions of the interior. Thus it would seem that Broken Hill, N.S.W., with a rainfall of less than ten inches, is particularly rich in these insects, and the largest number of new species must be credited to the energy of Mr. O. B. Lower, F.E.S., my valued correspondent in this locality. Almost equally rich is the dry, sandy region of Western Australia, and even the coastal portion of that State possesses a large number of fine species. From Mr. W. B. Alexander, F.E.S., Keeper of Biology in the W.A. Museum, Perth, I have received, for study, a small collection of Neuroptera containing some fine species; the types of the new species of this collection are in the West Australian Museum, and the descriptions are included in this paper. Other small collections of *Neuroptera* have been sent to me by Mr. G. F. Berthoud, of Waroona, W.A., Mr. G. A. Waterhouse, B.E., B.Sc.,

F. E. S., of Sydney, Mr. E. Allen, of Emerald, Q., Dr. A. J. Turner, F. E. S., of Sherwood, Brisbane, Q., and Mr. Rowland E. Turner, of London, (from Yallingup, W. A.). To all of these, I offer my sincere thanks for the valuable specimens received, without which my collection would still be a very poor one indeed. *

In this paper, eighteen species are proposed as new. One of these belongs to the family *Osmylidæ*, one to the *Ascalaphidæ*, and the remaining seventeen to the *Myrmeleontidæ*. This latter family offers considerable difficulty to the Australian systematist, chiefly because of the paucity of literature, the inaccessibility of the types of the species already described (mostly by Walker, Gerstaecker, and Banks), and also partly because of the close resemblance between many of the forms. I desire, therefore, to express my thanks to my friend, Mr. Esben Petersen, of Silkeborg, Denmark, for giving me his valuable opinion on a number of the forms described in this paper, and also for his excellent generic table, recently published in these Proceedings (1915, Vol. xl., Part 1, pp. 56-57), which I found of the greatest help, particularly in assigning positions to a number of new genera.

Four genera are proposed as new. No attempt has been made to break up the complex genera *Glenoleon*, *Formicaleon*, or *Acanthaclisis*, though *Alloformicaleon* Esb.-Pet., has been accepted as a valid genus. A new division of the subfamily *Dendroleontinæ* into three tribes has been proposed, based on venational and phylogenetic considerations.

The following is a list of the genera and species dealt with in this paper:—

Family OSMYLIDÆ.

EUPORISMUS, n.g. (Type, *E. albatrox*, n.sp.)

1. *Euporismus albatrox*, n.sp.

Family MYRMELEONTIDÆ.

Subfamily DENDROLEONTINÆ.

Tribe **Protoplectrini**, trib. nov.

2. *Protoplectron longitudinale*, n.sp.
3. *Protoplectron eremite*, n.sp.

Tribe **Dendroleontini**, trib.nov.

4. *Periclystus aureolatus*, n.sp.
5. *Dendroleon lambda*, n.sp.
6. *Dendroleon dumigani*, n.sp.
7. *Glenoleon bertinoudi*, n.sp.
8. *Glenoleon aurora*, n.sp.
9. *Glenoleon roseipennis*, n.sp.

Tribe **Distoleontini**, trib.nov.

10. *Gymnocnemia maculata*, n.sp.

BRACHYLEON, n.g. [Type, *B. darwini* (Banks)].

11. *Brachyleon darwini* (Banks).

STENOLEON, n.g. (Type, *S. fieldi*, n.sp.).

12. *Stenoleon fieldi*, n.sp.

XANTHOLEON, n.g. (Type, *X. helmsi*, n.sp.).

13. *Xantholeon helmsi*, n.sp.
14. *Alloformicaleon hyalinus*, n.sp.
15. *Alloformicaleon waterhousei*, n.sp.
16. *Distoleon nigrosignatus*, n.sp.

Subfamily MYRMELEONTINÆ.

17. *Myrmeleon loweri*, n.sp.
18. *Acanthaclisis peterseni*, n.sp.

Family ASCALAPHIDÆ.

Subfamily PROTASCALAPHINÆ.

19. *Stilbopteryx dromedaria*, n.sp.

Family OSMYLIDÆ.

EUPORISMUS, n.g.

Allied to *Porismus*, from which it differs as follows: wings longer, narrower in proportion, with the tips not broadly rounded but somewhat pointed, slightly falcate. Colour-pattern black and white. Rs close to and parallel with R (in *Porismus*, Rs diverges from R for about two-fifths of the wing-length, and then converges towards it apically). Branches of Rs very numerous, closely arranged, almost straight, and nearly parallel (in *Porismus*

they are fewer, wider apart, and less regular). Towards apex of wing, a set of cross-veins forms a distinct, curved line running across the wing from M to pterostigma, separating off an internal "disc" from a distinct apical portion, which carries only closely parallel, longitudinal veins (cf. *Psychopsis*); in *Porismus*, this line is absent. Four anal veins present, as in *Porismus*, but 2A and 3A stand further from the posterior border, and the cross-veins arising from them are longer and more numerous than in *Porismus*.

Genotype, *Euporismus albatrox*, n sp.

This genus may be placed as intermediate between *Porismus* and *Oedosmylus*; for, while it resembles the former in the strong branching of Cu, and in the dense wing-pigmentation, it approaches the latter in the shape of the wings, and in the possession of the apical line of cross-veins.

It is interesting to note that a fossil insect-wing, closely resembling the hind-wing of *F. albatrox*, has recently been discovered in sandstone-rock at Goodna, near Ipswich, Q. This rock is supposed to have come from a Tertiary deposit (?Eocene) overlying the Trias-Jura rocks of the Ipswich Coal-Measures.

1. EUPORISMUS ALBATROX, n.sp. (Pl i., fig.1).

Total length 16.5, abdomen 9.5, forewing 30, hindwing 28 mm.

Head very small, 2.5 mm. wide; *eyes* dark olive-brown; the three *ocelli* large, black, the median one very distinctly double; *epicranium* black, *antennæ* 11 mm., slender, black, basal joint twice as long and thick as the second; *labrum* and *mouth-parts* shiny brown.

Thorax: *prothorax* 1.7 mm., elongate, slender, orange-brown. *Pterothorax* orange brown, marked with black in the sutures, especially along the middle line; wing-bases blackish. Legs black, fore- and middle-legs short, hind-legs long.

Abdomen short, of medium width, dark grey above, marked with numerous, orange-brown spots; underside orange-brown, especially at apex.

Wings: *venation* very close and abundant. Costal border of forewing strongly arched near base; costal space wide near

base, gradually tapering towards pterostigma. All four wings strongly curved towards tips, which end in a slight point; the posterior margin being very slightly hollowed out towards the tip, the wings have a slightly falcate appearance. *Colouration*: forewing richly mottled with black and white, the former colour due to pigment, the latter to a very close arrangement of numerous, parallel, white veins. Costal space irregularly blotched with black patches, separated by hyaline spaces crossed by white veins. In the pterostigmatic region, and extending nearly to tip of wing, is a large, subtriangular, white patch, the curved wing-border forming its base, while its apex is directed posteriad and forms an angle a little greater than a right-angle. On this patch, two small black spots interrupt the white wing-border. The rest of the wing is very irregularly and heavily marked with black. Hindwing nearly all hyaline in its basal half; then follows a large, irregular, black blotch right across the wing before the level of the pterostigma, but somewhat interrupted between M and Cu distally; beyond this, covering the pterostigma and all the apical part of the wing except the extreme tip, is a whitish patch, larger and more irregular than the corresponding patch in the forewing. [In the dead insect, the black wing-pigment fades gradually to a dark, semi-transparent brownish, as in *Porismus strigatus*].

Hub.—Head of Condamine River, near Killarney, Q. Very rare. Mr. E. J. Dumigan captured, in January, 1914, four specimens sitting on the large rocks of the river-bed.

Type in Coll. Tillyard. (E. J. Dumigan; January 8th, 1914). Of the remaining three, one has been placed in Mr. Esben Petersen's collection, another in that of Mr. Nathan Banks, and the third remains in my collection.

Family MYRMELEONTIDÆ.

Subfamily DENDROLEONTINÆ.

This subfamily was formed by N. Banks to include all those genera in which there is only a single cross-vein in the radial space of the hindwing, before the origin of the radial sector. As

this character is based essentially on the archaic position of Rs, viz., originating from R close to the wing-base, it seems to me an excellent character for the main subdivision of the family, and marks off the large complex of forms included in the *Dendroleontinae* (to which the great majority of our Australian species belong) as definitely more archaic than the *Myrmeleontinae*, in which the radial sector of the hindwing has progressed much further along R.

In subdividing the mass of forms in the *Dendroleontinae*, it seems to me that too much stress has been laid on the presence or absence of tibial spines. In the dichotomous tables so far published by Banks and Petersen, this character is used for effecting the main dichotomy, and only later are venational characters brought into play. Now, I would urge an alteration of this procedure for two reasons; firstly, because it seems probable that some forms, at least, that lack spurs (if not all) did originally possess them,* and are really closely related to those forms (e.g., *Glenoleon*) which possess very short spurs, but which, on the present method of dichotomy, are driven right to the other end of the table; and secondly, because the wing-venation, particularly of the forewing, offers us more important and better understood characters, and a far better chance of making natural divisions. I would propose that, in no case, should the absence, or (if present) the size of the spurs be used for divisions greater than of generic value, since we cannot ignore the strong probability of convergent reductions of these organs in widely separated groups.

Turning, then, to the venation of the forewing, we can select, without hesitation, as a natural group, those peculiar genera in which Cu_2 runs parallel with $Cu_1 + M_2$ for a considerable distance. This is clearly an archaic character, carried over without change from *Nymphid*-ancestors. These genera form a distinct tribe, which I propose to name *Protoplectrini*. This tribe is represented

* The presence of these spurs almost universally in the Neuroptera, Trichoptera, Lepidoptera, and Mecoptera is a fact that cannot be ignored in our attempts at classification.

in Australia by the two genera, *Protoplectron* and *Pseudoformicaleon*, two genera which may be compared respectively with *Acanthaclisis* and *Myrmeleon* in the subfamily *Myrmeleontinæ*. The African genus *Creagis* would also appear to belong to this ancient group.

It appears that the position of the cubital fork has remained fixed, throughout the evolutionary development of the subfamily, at a point about one-fourth of the wing-length from the base. This is, therefore, a satisfactory *fixed level* from which we can observe the evolution of the radial sector in the forewing. This, as might be expected, has followed the same lines as in the hindwing, *i.e.*, gradual removal of its point of origin on R, from a point close to the base of the wing to a position further and further distad. Thus, just as the *Dendroleontinæ* are, as a whole, more archaic than the *Myrmeleontinæ*, on account of the position of the origin of Rs in the *hindwing*, so we may now select, from amongst the *Dendroleontinæ* themselves, those more archaic genera in which the same holds good for the *forewing*. This tribe, to which I give the name *Dendroleontini*, includes, then, all genera in which Cu_2 does not run parallel with $Cu_1 + M_2$, and having the origin of Rs in the forewing *before* the level of the cubital fork. This tribe contains a large number of genera, of which the Australian representatives are *Dendroleon*, *Glenoleon*, *Froggattisca* (an asthenic offshoot of *Glenoleon*), *Periclystus*, and *Chrysoleon*.

Finally, we may group together those genera in which the origin of Rs, in the forewing, has become shifted to a level either exactly above, or distad from, that of the cubital fork, as the tribe *Distoleontini*. The connecting-link with the *Dendroleontini* is not wanting, since the genus *Gymnocnemia* has the origin of Rs *exactly above* the cubital fork. But as, in other respects, this genus appears to belong rather to the *Distoleontini* than the *Dendroleontini*, it seems advisable to include it here rather than to separate it out as an intermediate tribe. The *Dendroleontini*, then, also contain a large number of genera, of which the Australian representatives are *Gymnocnemia*, *Brachyleon*, n.g., *Stenoleon*, n.g., *Xantholeon*, n.g., *Mucronemurus*, *Formicaleon*, *Allo-*

formicaleon, and *Distoleon*. The phylogeny of these three tribes may be exhibited thus:—



In this diagram, I have not attempted to show the ramifications of the subfamily *Myrmeleontinae*, whose headquarters lie quite outside Australia.

Tribe **Protoplectrini**.

In forewing, Cu runs parallel with $Cu_1 + M_2$ for some distance.

GENUS PROTOPLECTRON Gerst.

2. PROTOPLECTRON LONGITUDINALE, n.sp. (Pl. ii., fig.5).

Total length 30, abdomen 23·5, forewing $41\cdot5 \times 10\cdot5$ wide, hindwing $39\cdot5 \times 9$ mm wide.

Head: *epicranium* blackish, with two, small, brown spots on occipital ridge near eyes; *eyes* black, touched with grey above; *antennae* 9 mm., greyish-brown, ringed with black; *face* and *mouth-parts* pale, shiny orange-brown.

Thorax: *prothorax* short, $3\cdot5 \times 2\cdot5$ mm., downy, grey, with two, longitudinal, dorsal, blackish stripes. *Prothorax* grey, downy, with darker markings, a small but distinct, white spot close to base of each forewing; underside with soft, pale grey hairs. *Legs* rather short, stout; femora brown, with black stripes, and long, soft, grey hairs, also a few, stiffer, black hairs; tibiae similarly marked, with several, large, stiff, black hairs; first joint of tarsi very long, 2nd-4th short, 5th long, all blackish, claws brown; tibial spines long, reaching to end of first tarsal joint.

Abdomen fairly stout, uniformly shiny dark grey, with pale grey, downy hairs.

Wings: neuration grey-brown, Sc speckled. In forewing, along R up to pterostigma is a series of very narrow, blackish markings encroaching slightly into subcostal space; pterostigma blackish, covering 7-8 veinlets, all but three of them forked distally. Along $Cu_1 + M_2$ runs a thick, somewhat sinuous, longitudinal, black band, continued distally across M_1 to tip of wing. Hindwing without markings, pterostigma weakly indicated by a brownish patch.

Hab.—Western Australia; also Broken Hill, N.S.W. (O. Lower).

Type in Coll. West Australian Museum. Label "H. 22," indicating that it was collected by Mr. G. H. Hardy, now of the Tasmanian Museum, Hobart. No date or locality-label.

The Broken Hill specimen was unfortunately badly damaged in the post; only a small piece of the thorax, and the two wings of the right side, hanging by a thread, remain.

This rare species superficially resembles the commoner *Distoleon nigrosignatus*, from which, however, it can be distinguished at sight by the fact that the longitudinal, black mark is single and continuous, whereas, in *D. nigrosignatus*, it is broken into two parts. The venations of the two species are, of course, quite distinct. It is somewhat remarkable that there should be, in a small collection of Western Australian forms, representatives of three genera (*Protoplectron*, *Distoleon*, *Glenoleon*) having this unique development of a longitudinal, black line in the forewing, while, in a fourth (*Dendroleon*), there is also a considerable development of black pigment.

3. PROTOPLECTRON EREMIÆ, n.sp. (Pl. ii., fig.4).

Total length 19, abdomen 13, forewing 24.5, hindwing 23mm.

Head: *epicranium* grey, with black markings behind and a touch of brown in front; *eyes* dark grey; *antennæ* 6mm., greyish; *face* orange-brown, *mouth-parts* blackish.

Thorax grey-brown with blackish markings; on prothorax, two, parallel, longitudinal, blackish bands. *Legs* greyish, very short and thick, hairy.

Abdomen grey-black, smooth above, sides with numerous, fine, grey hairs; a fine, transverse, brown line at apex of segments 4-8.

Wings rather narrow and pointed. Venation of forewing speckled black and white, likewise Sc in hindwing, rest of venation of that wing blackish. In forewing, the pterostigma has a strongly-marked, black, proximal patch; in hindwing, only a very slight touch of black along R. Hindwing hyaline, forewing much marked with small, blackish spots and patches, especially along R, $Cu_1 + M_2$ and the branch of Rs next but one above M_2 ; many cross-veins and dichotomous forkings also touched with black.

Hab.—Broken Hill, N.S.W. A single specimen taken by Mr. O. Lower; November 11th, 1902.

Type in Coll. Tillyard. Unique.

Closely allied to *Pr. venustum* Gerst., from which it can be at once distinguished by its shorter wings, shorter and stouter abdomen, and by the lack of the strikingly beautiful effect of the pattern of the forewing, from which Gerstaecker's species received its name. *Pr. eremicæ* is possibly a dwarfed, inland species geminate with *P. venustum*, which appears to be confined to the coastal strip and eastern river-valleys.

Tribe Dendroleontini.

In forewing, Cu_2 bends sharply away from $Cu_1 + M_2$. Rs arises at a level proximal to that of the cubital fork.

Genus PERICLYSTUS Gerst.

4. PERICLYSTUS AUREOLATUS, n.sp. (Pl. ii., fig.3).

Total length about 19 (tip of abdomen bent under), forewing 26.5 by 7.5 wide, hindwing 24.5 × 5mm.

Head orange-brown, except for a black area between the eyes, isolating two orange spots, one at base of each antenna; eyes black, shining; antennæ short, 3 mm., brownish at base, shading to reddish at tips.

Thorax orange-brown above, with black marks in the suture, and touches of black near the wing-bases; underside

shining black, with small, but conspicuous, orange-brown spots. *Legs*: fore and middle moderate, hind very long, black, spotted with orange as follows—base and apex of femora, base of tibiae and a small spot about 1 mm. distad from it; basal joint of tarsus orange, second brownish, third blackish, fourth brownish, fifth orange-brown, blackish distally, claws brownish; tibial spurs as long as first two tarsal joints.

Abdomen (somewhat shrivelled and bent) fairly slender, banded transversely with alternate orange and black, the black predominating distally, the orange being reduced to small spots; tip broadly truncate, orange, with short, black, hairy appendages.

Wings: posterior border of forewing twice angulated, once near middle of wing, very obtusely (*middle posterior angle*) and once more distally (*angle of the falcate border*); the part of the border between this angle and the apex (*falcate border*) is very slightly hollowed out, so that the wing is slightly falcate. In the hindwing, there is only one posterior angle, the border between it and the apex being irregularly waved.

Costa pale brownish, all other veins whitish. Forewing beautifully marked with numerous, irregular spots, some semi-transparent orange, some dark brown or black, and others dark brown with golden centres; base slightly saffroned for about 3 mm. These spots are arranged as follows—along Sc and R, *nine* spots, three, small, basal ones, then a larger, blackish, sub-rectangular one 6 mm. from base; 3 mm. further on, a similar but slightly smaller spot; 2 mm. further on, a slightly larger spot, dark brown with orange-gold centre; 2.5 mm. further on, a similar but narrower spot; a similar but more rounded spot surrounding the radial brace; between these two last, a small rectangular spot with golden centre. All these spots just touch Sc from below, but they lie, on the whole, well below R. Pterostigma marked by an opaque, whitish, oval area surrounding a small dark brown spot, also a somewhat concentric, blackish spot between this and the last of the row of radial spots. Between R and Rs near apex, there are two, small, dark, squarish spots, with orange-gold centres. Along $Cu_1 + M_2$, touching M_1 from below, are four, orange-gold spots touched posteriorly with brown,

followed by a dark brown spot, above which, slightly proximad, lies a small, brown spot. In the cubital space, there are four, elongated, narrow, blackish spots. At the apex of the wing, is a large, irregular, transparent, orange blotch; a smaller blotch runs in from the wing-border between this and the pterostigma, and below it is a small, squarish, brown spot with a pale orange centre-point. From the apex towards the angle of the falcate border, lie four, transparent, orange blotches, with three, irregularly placed, brownish spots lying proximad to them. Along posterior margin of wing, a large, irregular, trapezoidal, orange blotch occupies the middle, posterior angle, and is touched above by black; half-way between this and the wing-base, is a smaller, oval spot of the same colour.

The hindwing shows very few markings, all distally placed, and of a uniform brown, except for three, minute spots along Sc + R. A large, reniform spot overlies R and Rs at level of the angle of the falcate border, which itself is filled with a larger and more irregular blotch. Pterostigma whitish, opaque, with two, small spots near it. A rounded spot at apex, and two, elongated marks on the falcate border complete the markings.

Hab.—Cunderdin, W.A. A unique specimen, apparently a male, but the abdomen is somewhat shrivelled.

Type in Coll. West Australian Museum, Perth. Museum label No.6972; no date.

This very beautiful insect is at once distinguished from the other two species of the genus by its small size, and by the beautiful and bizarre effect of its colouration, which suggests a stained-glass window in old gold. It appears to be more closely related to *P. lacertatus* Gerst., than to the better known *P. circuiter* Walker, owing to a closer similarity in the scheme of wing-markings. From both these species, it differs in having the forewing much less falcate.

Genus DENDROLEON Brauer.

5. DENDROLEON LAMBDA, n.sp. (Pl. iii., fig.7).

Total length (abdomen broken off) about 20 mm., forewing 21, hindwing 19.5 mm.

Head small, *epicranium* grey-brown, with a pale line in front between the eyes; *eyes* black; *antennæ* 5 mm., brownish, ending in a large, black, subtriangular knob; *labrum* and *mouth-parts* rich brown.

Thorax greyish-brown. *Legs* with blackish femora, tibiae brown tipped with black, tarsi brown; tibial spurs curved, reaching to middle of second tarsal joint.

Abdomen [broken off at 3rd segment] appears to have been dull grey with fulvous blotches.

Wings: venation dark brown. Forewings with beautiful black or dark brown markings as follows — an elongated basal patch along costal space, crossing Sc and R and reaching M_1 distally; across wing, obliquely near middle, there runs an irregular mark resembling the Greek λ (lambda), but with its apex somewhat blurred and swollen; on the pterostigmatic area is a large, elongated, triangular blotch, followed distally by a slender, longitudinal mark for about 2 mm.; from posterior border, below pterostigma, there runs obliquely upwards towards the tip, across the ends of M_2 and M_1 , a dark band, bent in the middle, about 4 mm. long. Small spots and specks shade the bases of many of the cross-veins. Hindwings with irregular blotchings between Sc and R in basal half; about two-thirds of the way along the wing, an irregular patch covers both Sc and R, while a small patch lies on the pterostigma; on the posterior margin, just below the end of $Cu_1 + M_2$, lies a fainter, smoky patch.

Hab.—Haryey, W.A. January, 1912. Unique.

Type in Coll. West Australian Museum. Museum No.6601.

This very beautiful little insect is very distinct from all others of the genus, and is easily recognised by its small size, and the peculiar "lambda-mark" on the forewings.

6. DENDROLEON DUMIGANI, n.sp. (Pl. iii., fig.6).

Total length 21, abdomen 15, forewing 28.5, hindwing 27.5 mm.

Head: *eyes* grey-brown; *epicranium* black, a transverse, grey-brown band above antennæ; these latter 6 mm., brown, with paler rings; tips elongate-oval, flat, concave above, black; a

brown spot below base of each; *face* and *mouth-parts* dull testaceous

Thorax: *prothorax* long and narrow, slightly wider behind, dull brown with paler, longitudinal markings. *Pterothorax* broader, similarly coloured and marked; underside pale testaceous. *Legs* very long and slender; forelegs black, basal and apical fourths of tibia testaceous;* middle and hindlegs testaceous, the femora strongly tipped with black, the tibiae slightly so; tarsal joints mostly black.

Abdomen slender, dull grey-brown; 1 and base of 2 testaceous, 3-8 with a basal, testaceous mark projecting apically into a sharp point.

Wings: *venation* brown, Sc and R speckled with whitish. *Forewing* with a narrow, black mark on pterostigma, several blackish specks along posterior margin, and veinlets towards apex mostly clouded with brown. *Hindwing* with a diffuse patch of dark brown just above posterior margin, two-thirds of the distance along the wing from base, a touch of brown proximad to pterostigma, and another distad from and just below it. Veinlets of *pterostigma* in both wings whitish. In forewing, only three cross-veins in radial space, the third being whitish. Origin of Rs about two cells' width proximad from level of cubital fork; the oblique vein placed far beyond the fork (3-4 cells distant).

Hab.—Linville, Q. (Brisbane River Valley). A single specimen, apparently a male, taken on February 22nd, 1915, by Mr. E. J. Dumigan, to whom I dedicate the species

Type in Coll. Tillyard.

Easily distinguished from *D. longipennis* Esb.-Pet., (New South Wales), by its larger, broader, and less pointed wings, less marked with black or brown. In *D. longipennis*, also, the difference in level between the origin of Rs and the cubital fork is greater.

* I have used this word throughout as indicating a dull, pale yellowish-brown, *i.e.*, earthenware-colour (Lat. *testaceus*). It has sometimes been used to indicate a dull brick-red, *i.e.*, tile-colour. The Latin word admits of both meanings.

Genus GLENOLEON Banks.

7. GLENOLEON BERTHOUDI, n.sp. (Pl. iii., fig 8).

Total length 21, abdomen 13, forewing 29.5, hindwing 26 mm.

Head: *eyes* blackish; *occiput* brownish, with three, black spots, and an irregular, transverse, black line above; from the middle of this, a short, median line runs up on to the occipital ridge, and is flanked on either side by a transverse, black bar; rest of *epicranium* shiny black; *antennæ* 6 mm.; face straw-coloured, *mouth-parts* pale, spotted with brown.

Thorax: *prothorax* fairly wide, dull grey-black with brownish markings. *Pterothorax* greyish-black, with numerous, brownish markings; in particular, a fine, mid-longitudinal line, a pair of curved bands on mesonotum, and a pair of oblique stripes on metanotum. *Legs*: fore- and middle-legs with dull brown femora tipped with black, tibiae brown, with three, black patches, tarsi blackish; hindlegs with brown femur, pale brownish tibia just tipped with black, tarsus pale at base, brown beyond. ♀

Abdomen greyish-black, with numerous, small, brown markings on segments 3-8.

Wings rather long and pointed, *venation* brownish. *Pterostigma* blackish in forewing, covering only 4-5 veinlets, but the black is continued obliquely inwards on to Rs; in hindwing, the pterostigma is small, opaque, and whitish, covering 3-4 veinlets, and touched with black proximally. In forewing, Sc and R, and the space between, are speckled with black; in the median space, from base almost to tip, there runs a conspicuous, black, longitudinal streak, which turns upwards at about two-thirds of its length to run obliquely parallel to, and beneath, the black, pterostigmatic patch, and ending 3 mm. from tip; the bent portion of the streak is brownish. On posterior border of forewing are two, small, oblique patches; one at about one-third from the base slants upwards and outwards, blackish; the other, more distally placed, is pale brown, and runs upwards and inwards; around these, and also near apex, are many brown specks on cross-veins. In hindwing, a large, round, dark brown blotch occupies the region of M₁ and M₂ at about two-thirds of the

wing-length from base; there is also a small, black mark on the radial brace.

Hab.— Waroona, W.A. Taken by Mr. G. F. Berthoud, to whom I dedicate the species, on February 23rd, 1911. Unique. Type in Coll. Tillyard.

S. GLENOLEON AURORA, n.sp. (Pl. iv., fig.9).

♂. Total length 19, abdomen 10·5, forewing 24, hindwing 21·5 mm.

Head: *eyes* olive-grey; *epicranium* reddish-brown, with three, small, black spots on occiput; in front, a transverse band of shining black, passing between the eyes and enclosing bases of antennæ; these latter 4·5 mm., brownish, tipped with blackish; *face* and *mouth-parts* yellowish-brown.

Thorax dull reddish-brown, marked with dark grey. *Legs*: femora orange-brown tipped with dark grey, tibiae and tarsi greyish-brown.

*Abdomen alternately banded, very irregularly, with orange-brown and dark grey; on the orange-brown portion of 3-6 are some blackish spots or lines.

Wings with a delicate, pinkish sheen on the nearly hyaline membrane; *venation* of forewing blackish along costa, speckled pink and black on Sc, R, and Rs, the rest brownish speckled with black. In hindwing, costa paler and veins less speckled. *Pterostigma* in both wings distinct, about 1·5 mm., mostly pink, but touched proximally with brown. Hindwing with a small, brown blotch at distal end of M₁ and Cu₁.

♀. Differs from ♂ in having less black on epicranium, the wings less speckled, somewhat pinker, and without the brown blotch on the hindwing. Wings considerably wider, less pointed, and altogether larger than in ♂.

Hab.— Broken Hill, N.S.W. Several specimens taken by Mr. O. Lower, in 1900 and 1902.

Types, ♂♀, in Coll. Tillyard; (♂, December 4th, 1900; ♀, November 10th, 1902; Broken Hill; O. Lower).

This species and the succeeding one are very distinct from all other species of the genus by the beautiful, pink sheen of the

wings, and by their peculiar facies, which comes closest to that of *G. annulicornis* Esb.-Pet. The sexual dimorphism, which is more or less noticeable in all species of this genus, is, in *G. aurora* (and probably also in *G. roseipennis*) extremely marked.

9. GLENOLEON ROSEIPENNIS, n.sp.

♀. Unique. Closely allied to the preceding, but differing from it by its much greater size, duller colouration, very large head, and roseate pterostigma.

Total length 19, abdomen 10, forewing 33, hindwing 30 mm.

Head very large, 3.6 mm. wide, dull greyish-brown

Thorax greyish, touched with brown on sides and on notum.

Abdomen with alternating, fairly regular bands of orange-brown and blackish, [much faded].

Wings much as in *G. aurora*, more rounded at tips, costa brownish. Sc, R, and Rs very little speckled with black; the wing-membrane lightly washed with rose-pink in places. *Pterostigma* of forewing 1.8 mm., rich orange-pink, surrounded by rose-pink, which extends to tip of wing; of hindwing, 1.3 mm., orange-pink, with less rose-pink beneath it, and very little towards wing-tip. No brown blotch on hindwing.

Hab.—Winton, Q. A unique ♀, taken by Mr. R. L. Higgins, in 1912.

Type in Coll. Tillyard.

Tribe **Distoleontini**.

In forewing, Cu_2 bends sharply away from $Cu_1 + M_2$. Rs arises at a level distal from that of the cubital fork (in *Gymnocnemia*, exactly above it).

Genus GYMNOCNEMIA Schneider.

10. GYMNOCNEMIA MACULATA, n.sp. (Pl. iv., fig. 11).

Total length 16.5, abdomen 10, forewing 23, hindwing 19.5 mm.

Head: eyes olive-grey; *epicranium* dull yellowish-brown, with a fine ψ -mark in black on the occiput; two, black, transverse lines run, one on either side of the top of this mark in front; a black, shiny patch between bases of antennæ, which are 5 mm. long, dark brown, with blackish tips; *face* yellowish-brown, shiny; *mandibles* and *maxillary palps* blackish.

Thorax: *prothorax* yellowish-brown, with a broad, longitudinal, median, dorsal, grey-brown stripe, divided down the middle by a fine, pale line. *Pterothorax* pale straw-colour, with a similar, median, dorsal stripe, and a greyish-black mark on each side just above the wing-bases. *Legs* dull brown; femora with a blackish, apical spot, tibiae with three, black spots, tarsi partly blackish.

Abdomen rather short, grey-black with dull, brownish markings, in the form of an irregular patch covering most of each segment, on either side of the median line, and isolating a median, longitudinal band of greyish-black, which is divided, as in the thorax, by a fine, pale, median, longitudinal line; sutures greyish-black.

Wings mostly hyaline, well-pointed; *venation* brownish. R, Rs, and $Cu_1 + M_2$ speckled with black. *Pterostigma* strongly marked as a pale brown area bordered proximally with black; total length about 2 mm., covering some seven veinlets, some of these being branched. In forewing, the origin of Rs and of some of the cross-veins from R to Rs strongly blackened; a short, oblique, dark brown mark runs upwards from near end of M_2 (below level of pterostigma) through five cells, ending just beneath the Banksian line, which is well-marked; a somewhat similar mark overlies the ends of Cu_2 and A_1 on the posterior border. In the hindwing, there is an irregular, dark brown blotch below R and Rs, just before pterostigma, a smaller blotch at distal end of hypostigmatic space, and a rather large, irregular splash of dark brown above the posterior border, at the level of the radial brace.

Hab.—Broken Hill, N.S.W. Four specimens taken by Mr. O. Lower (undated).

Type in Coll. Tillyard.

Genus BRACHYLEON, n.g.

In forewing, Rs arises about one cell distad from level of cubital fork; the oblique vein lies directly under origin of Rs. No Banksian line present. M_1 and $Cu_1 + M_2$ in forewing unite before the wing-margin. In forewing, 1A is a straight line to

wing-border. In hindwing, there is no distinct Cu_2 ; Cu_1 is straight, not arched concavely to posterior border. Five cross-veins before origin of Rs in forewing. Hindwing narrower, and slightly longer than forewing, very pointed.

Legs short; tarsus with first joint moderately long, 2nd-4th very short, fifth long; spurs present, nearly as long as first two joints of tarsus.

Abdomen short.

Genotype, *Brachyleon darwini* (Banks).

This genus may be placed next to *Gymnocnemis* on account of the position of the origin of Rs in forewing, but differs strongly from it in possessing spurs, and in lacking the Banksian line. It differs from *Macronemurus* Costa, in its short abdomen, and short legs, with long, stiff hairs.

11. BRACHYLEON DARWINI Banks. (Pl. iv., fig.10).

Macronemurus darwini Banks, Proc. Acad. Nat. Sci. Philadelphia, 1914, p.619 (issued 1915).

Head dark brown above; two, pale spots on occiput near eyes, which are very dark brown; antennae fulvous at base [the rest missing]; face brownish, shading to fulvous on labrum; mouth-parts fulvous.

Thorax: prothorax pale brown, with two, broad, longitudinal stripes of darker brown. Pterothorax and legs shiny brown.

Abdomen short, slender, rich brown without any markings.

Wings venation brown; in forewings, Sc, Rs, M, and Cu speckled. Costal cross-veins very numerous, especially in forewing. Pterostigma in forewing clouded with brown, in hindwing clear. Apical cross-veins in all wings marked with brown specks. In all wings, an irregular, brown streak runs obliquely up from near the end of M_1 to near apex; this streak is longer and more diffuse in hindwing than in forewing. In hindwing, Cu_1 is dark, M pale. Only five branches of Rs before radial brace.

Hab.—Darwin, N.T. One specimen, taken on April 6th, 1913, by Mr. G. F. Hill, Government Entomologist.

Type in Coll. Banks.

Genus STENOLEON, n.g.

Wings excessively narrow, pointed; in forewing, Rs arises well beyond brace of cubital fork, and is somewhat bent at the origin of its first descending branch; 5-6 cross-veins in radial space in forewing; oblique vein lying about under level of origin of Rs. No Banksian line present. Costal space very narrow in forewing, but widened near base in hindwing by the upward arching of C.

Legs moderately long: first and fifth tarsal joints about equal; 2nd-4th very short; spurs present, short, about as long as first tarsal joint. Abdomen slender, rather short.

Genotype, *St. fieldi*, n.sp.

This genus, which appears to have no near allies except, perhaps, the African *Nemoleon*, is a highly reduced offshoot from the main *Distoleontine* stock, easily distinguished from all other Australian genera known to me by the combination of characters given above.

12. STENOLEON FIELDI, n.sp. (Pl. v., fig. 13).

Total length 19·5, abdomen 13·5, forewing 20·5 by 4 wide, hindwing 19 by 3 mm. wide.

Head: *epicranium* dull brownish; *antennæ* evidently long [tips lost], dark brown, strongly marked with pale rings; bases of antennæ, whole of face, and mouth-parts testaceous.

Thorax: *prothorax* subcylindrical, the anterior third marked off by a transverse groove; grey-brown, with a paler, median, longitudinal line, and two, parallel, lateral bands. *Pterothorax* grey-brown with paler markings; underside grey. *Legs*: *coxæ*, trochanters, and bases of femora pale testaceous; femora blackish, tibiæ brown, with a black spot one-third from base and another at apex; tarsi with first joint pale brown, 2-4 dark, 5 pale, with black apical third.

Abdomen narrow, cylindrical, dull grey, with transverse, ochreous lines on apices of segments 3-8.

Wings: *venation* mostly whitish, costa grey in both wings, also Cu in hindwing. Sc speckled. A conspicuous, dark spot proximal to pterostigma in both wings. Forewing much spotted

with brown, as follows—on two or three of the cross-veins in the cubital space, also at the origin of Rs, on the third and fifth cross-veins beyond it, and on the radial brace; on the 4th-6th cross-veins in median space, and on the first four cross-veins in the cubital space. A larger blotch above the posterior margin just before half-way, crossing Cu_2 and running up to M_2 ; near apex, several, small, cloudy patches. In hindwing, a cloudy patch over ends of M and Cu_1 , extending as a faint smokiness almost to apex.

Hab.—Tennant's Creek, Central Australia. Taken in November, 1906, by Mr. J. F. Field, to whom I dedicate the species.

Type in Coll. Tillyard. Unique.

A very distinct and peculiar little species.

Genus XANTHOLEON, n.g.

Insect of very slender build. In forewing, Rs arises about two cells' width distad from level of cubital fork, and is rather irregular in form; oblique vein close to the fork (within one cell's distance). No Banksian line present. The cells below $Cu_1 + M_2$ in forewing, and below Cu_1 in hindwing, are very regularly arranged, and separated into oblique rows by numerous, parallel sectors descending from the main vein. Hindwing slightly longer than forewing. Antennæ long and slender, with weak, elongated club. Legs of median length, slender; tarsi with first joint a little longer than fifth, 2nd-4th very short; spurs present, longer than first tarsal joint. Abdomen slender.

Genotype, *X helmsi*, n.sp.

A very distinct and clearly marked-off genus, whose affinities appear to be somewhat doubtful. In the delicacy of its structure, it appears to hold about the same relationship to *Distoleon* that *Froggattisca* does to *Glenoleon*.

13. XANTHOLEON HELMSI, n.sp. (Pl. v., fig.12).

Total length 24.5, abdomen 17.5, forewing 29, hindwing 30mm.

Head pale yellowish all over, except for the black eyes. Antennæ yellowish, slender, 7 mm. long.

Thorax pale yellowish; *legs* straw-colour with a dark patch at apex of femur, another near base of tibia, a third at apex of same; tarsal joints brownish apically, claws dark.

Abdomen rather short, slender; 1 yellowish, 2 pale brown, 3 yellowish at base, shading to dull brown; the rest dull brownish touched with pale brown on apices of 7-9.

Wings with very pale, straw-coloured venation, abundantly speckled with brownish, especially along R, M, and Cu. *Pterostigma* large in all four wings, 2 mm., pale straw-coloured, covering about 8 cross-veins, and touched with brown at the inner angle. Four cross-veins in radial space of forewing; 5-6 descending branches of Rs before radial brace.

Hab.—Sydney, N.S.W. Two specimens, collected in October, 1909, by the late Mr. Helms, to whom I dedicate the species.

Type in Coll. Tillyard; cotype in Coll. Petersen.

This delicate and almost ghost-like species is quite distinct from any other *Myrmeleonid* known to me.

Genus ALLOFORMICALEON Esb.-Pet.

Differs from *Formicaleon* Brauer, by the absence of the Bankian line.

14 ALLOFORMICALEON HYALINUS, n.sp. (Pl. vi., fig.16).

Total length 22, abdomen 16, forewing 25.5, hindwing 24 mm.

Head dark grey above, a pale, transverse line across occiput; *antennæ* long, 6.5 mm., slender, black, strongly clubbed; *face* blackish, *orbits* edged with pale cream, *genæ* and *labium* yellowish.

Thorax: *prothorax* short, dull greyish above, yellowish beneath. *Pterothorax* dull greyish-brown above, mottled with paler grey: underside grey, with some yellow markings. *Legs* greyish: hind femora very pale at bases, touched with black in middle and at apex; hind tibiæ pale, with a touch of black at apex.

Abdomen slender, subcylindrical, uniform grey-black: appendages touched with straw-colour.

Wings: *venation* blackish, Sc speckled in both wings; wings quite hyaline except for a slight touch of black basally on ptero-

stigma of forewing; the veinlets of the pterostigma whitish. In forewing, only five branches of Rs before radial brace. Oblique veins very clearly marked, very close to cubital fork (less than one cell's length distant). In forewing, 1A black, forming a straight line to wing-border. Cross-veins in cubital space of forewing fairly numerous and close.

Hab.—Stradbroke Island, Q. Two specimens, bred in November, 1915, from large larvæ, which do not form pits, but hide in loose soil at the bases of trees.

Type in Coll. Tillyard (bred November, 1915).

This species superficially resembles *Myrmeleon uniseriatus* Gerst., in colour and facies, but has narrower and less pointed wings. Its nearest ally is *Alloformicaleon australis* Esb.-Pet., (Sydney), from which it can be at once distinguished by its smaller size, shorter wings, the hindwing not being as long as the fore, and by the completely different, and much darker colour-scheme.

15. ALLOFORMICALEON WATERHOUSEI, n.sp. (Pl. v., fig. 14).

Total length 19.5, abdomen 13, forewing 25, hindwing 24 mm.

Closely allied to the preceding species, but distinguished as follows. On all four wings, a black mark on the stigma, and a smaller mark at same level on M_1 (this mark is a mere speck in hindwing); in forewing, a larger, oblique, black streak arises from just before middle of posterior border, and runs up across Cu_2 to bend parallel to $Cu_1 + M_2$ at one cell's distance below it. In forewing, 1A speckled, not quite a straight line; cross-veins in the cubital space of forewing very few and wide apart; also $Cu_1 + M_2$ arches up more strongly than in *A. hyalinus*. *Antennæ* bordered by a pale line in front of bases; *face* pale straw-colour. Hind *femora* black, except for the very pale bases. *Abdomen* somewhat stouter than in *A. hyalinus*, similarly coloured, but with pale, transverse lines across apices of segments 2-8.

Hab.—Woodford, Blue Mountains, N.S.W. (2,000 feet). Three specimens taken in February, 1909, by Mr. G. A. Waterhouse, to whom I dedicate the species. A single specimen, somewhat more heavily marked on wings, bred from a larva indistinguish-

able from that of *A. hyalinus*, on November 5th, 1915, from Stradbroke Island, Q.

Type in Coll. Tillyard (Woodford; G. A. Waterhouse; February 12th, 1909)

Genus *DISTOLEON* Banks.

16. *DISTOLEON NIGROSIGNATUS*, n.sp. (Pl. vi., fig. 17).

Total length, ♂ 25, ♀ 26; forewing, ♂ 30, ♀ 32; hindwing, ♂ 29, ♀ 32 mm.

Head dark grey above, with a small, oval, brownish spot on occiput near each eye; a black band just in front of, and between, bases of *antennæ*, which are 8 mm. long, grey ringed with black, bases slightly brownish; *face* pale brownish.

Thorax downy, greyish, a touch of brown at wing-bases. *Legs* rather short, hairy, coxæ of forelegs brownish; femora grey, tibiæ and tarsi pale brownish with blackish markings.

Abdomen uniformly dull greyish.

Wings very long and narrow; veins mostly greyish; Sc speckled with black, Rs and Cu also blackish. *Pterostigma* in forewing greyish-white, with a black, basal patch covering about nine veinlets, five of which are forked; in hindwing, *pterostigma* is only a slight darkening on 5-6 veinlets. Forewing marked with long, black stripes as follows—a straight stripe running parallel to, and below Rs distally, slightly waved as it crosses each branch of Rs; a long and slightly curved stripe along the main stem of Cu to the fork, where it is thickened, and thence along $Cu_1 + M_2$, gradually tapering to a fine streak, and finally bending slightly up to cross M_1 , and to run wavily for 3 mm. up across two branches of Rs; also a short, curved stripe placed concavely to the posterior border, about midway along the wing, arising from the end of Cu_2 , and arching up towards the middle of $Cu_1 + M_2$. In hindwing, only a slight, double smudge of brown placed distally on M and Cu_1 and also on two branches of Rs above them; also a touch or two of black near apex. All the above marks are very complete and definite in ♀, but, in ♂, they are narrower, paler, and more or less reduced.

Hab.—Perth, W.A., and suburbs. Several specimens, taken by Mr. W. B. Alexander, Keeper of Biology in W.A. Museum,

in February-March, 1913. A single ♀ from Broken Hill, taken by Mr. O. Lower (undated).

Types: ♂ in Coll. Tillyard (Cottesloe, W.A., February 18th, 1913; W. B. Alexander; Museum No.6726); ♀ in Coll. W. A. Museum (Subiaco, W.A.; March 12th, 1913; W. B. Alexander; Museum No.6898).

The Broken Hill ♀ differs from the Western Australian specimens in having a row of black spots along the posterior margin of the forewing, at the ends of the cross-veins descending from 1A.

This very distinct and handsome species appears to be quite common around Perth. Its superficial resemblance to *Protoplectron longitudinale*, n sp., has been already noted.

Subfamily MYRMELEONTINÆ.

Genus MYRMELEON Linn.

17. MYRMELEON LOWERI, n.sp. (Pl. vi., fig.15).

Total length 29, abdomen 21, forewing 29, hindwing 26 mm.

Head 3 mm. wide; *eyes* pale grey; *epicranium* grey, a small, yellowish patch just in front of *antennæ*, which are 4 mm. long, with tips in the form of a flattened club; *face* chiefly dark grey, *genæ* and *labrum* dull orange-yellow, *labium* yellowish.

Thorax pale powdery-grey, anterior lobe and base of prothorax lemon-yellow, as are also the wing-bases and the latero-posterior edges of the mesonotum; sutures of pterothorax dark. *Legs* short, dull orange, a patch of black distally on femora, a greyish tinge on tibiæ; tibial spurs, distal spines of the tarsal joints, and claws black.

Abdomen fairly long and slender, powdery-grey; two, small, yellow spots at base of 1; suture between 1 and 2 blackish, a trace of two, fine, yellow spots apically on 3, the same spots larger and more distinct on 5-7 and on sides of 8; 9 touched with yellow, blunt, hairy at tip.

Wings with pale yellow *venation*; bases strongly yellowish; about 34 costal cross-veins before pterostigma in both wings. *Pterostigma*, in forewing, distinct, pale brownish, covering 7-8 veinlets, some of which are branched; in hindwing, fainter,

covering only the lower portions of four veinlets. Before origin of Rs, in radial space, seven cross-veins in fore, five in hindwing. In both wings, five branches of Rs before radial brace.

Hab.—Broken Hill, N.S.W., collected by Mr. O. Lower, to whom I dedicate the species. Bourke, N.S.W., collected by the late Mr. Helms. Fairly common

Type in Coll. Tillyard (Broken Hill, undated, O. Lower).

A very distinct and striking species

GENUS ACANTHACLISIS Ramb.

18. ACANTHACLISIS PETERSENI, n.sp. (Pl. i., fig. 2).

Total length 45, abdomen 31, forewing 66.5, hindwing 62.5 mm.

Head: *eyes* brown; *occiput* greyish black; *antennæ* 10 mm, black, very slightly clubbed; *epicranium* and *face* dark grey, hairy; *labrum* and *mouth-parts* rich brown, *labium* fulvous.

Thorax: *prothorax* short, tapering towards head, grey-black above, brown on sides. *Pterothorax* brownish, with grey shading, and long, soft, grey hairs; underside covered with thick, pale grey hairs. *Legs* short; femora brown; those of forelegs very hairy; tibiæ brown, those of fore and middle-legs touched with black on basal half; tarsi very short, 1-4 blackish, 5 pale, with deep apex and claws.

Abdomen cylindrical, with close-set, small, black hairs, 1-2 and apex with longer hairs: colour black, with irregular, brown patches on either side of middle line on segment 3 (very slight) and segments 4-7.

Wings wide, fairly well pointed; *venation*, in general, brown, C, Sc, and R tinged with orange; $Cu_1 + M_2$ in forewing strongly marked with black. A pale ochreous area on *pterostigma* of all four wings. Forewings strongly speckled all over, due to all the veins being irregularly marked with black. In radial space, before origin of Rs, eight cross-veins in fore, six in hindwing. In forewing, Cu_2 diverges very strongly from $Cu_1 + M_2$; the oblique vein is black, 3-4 cells' length distad from the cubital fork. Cubital space in forewing wide, triangular, with four, single cells, then two together, then three at widest part, and, finally, three single cells at distal end.

Hab. -Cooktown, North Queensland. Taken by myself, January, 1908.

Type in Coll. Tillyard. Unique.

This magnificent insect is clearly very closely allied to *A. fulva* Esb.-Pet., from which it differs by its smaller size (*A. fulva*, forewing 72 mm., total length 55 mm.) and darker colouration, as well as by having four cross-veins in the radial space. In *A. fulva*, the antennæ are pale yellowish-brown, the head, prothorax, and mesothorax yellowish-red. The legs in *A. fulva* have the tibiæ differently marked; the abdomen is brown, with paler apex; the apices of the segments darkened.

The differences separating *A. peterseni* from *A. fulva* appear to be of the same order as those separating *A. fundatus* from *A. subtendens*. In both cases, we appear to be dealing with a pair of geminate species, but, in the case of *A. peterseni* and *fulva*, as the type of each is a unique specimen, we cannot yet say what the constant differences between them may be.

Family ASCALAPHIDÆ.

Subfamily PROTASCALAPHINÆ.

Genus STILBOPTERYX Newman.

19. STILBOPTERYX DROMEDARIA, n.sp. (Text-figs.1-3).

♂. Total length 61, abdomen 47, forewing 48 by 9 wide, hind-wing 44 by 8 mm. wide.

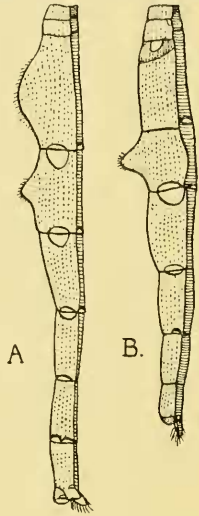
Head: *epicranium* black, with thick, black hair; *antennæ* black, *without yellowish rings*, tips strongly knobbed, black; *eyes* brown, *frons* black, *clypeus* and *labrum* bright golden-yellow, *genæ* and *labium* brown.

Thorax blackish above, with thick, soft, dark grey hairs; sides and underside thickly clothed with long, greyish-white hairs. *Legs* completely shining-black, except claws, which are dark reddish.

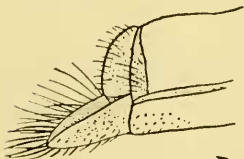
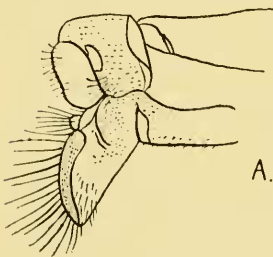
Abdomen very long (Text-fig., 1, A) black; 1-2 short; 3 very long, much swollen dorsally, with a convex hump carrying short hairs, and with a pair of large, rounded, latero-basal, golden-yellow spots, slightly overlapping on to 2, also a pair of small,

apico-ventral spots of same colour, subtriangular; 4 long, swollen dorsally into a median tubercle, slightly bifid, and clothed with stiff, short hairs; a pair of large, round, latero-basal, golden-yellow spots slightly overlapping on to 3, the small, apico-ventral spots present, larger than in 3; 5 long, tapering towards apex, marked as in 4; 6 narrow-cylindrical, with latero-basal spots present, but smaller, and half overlapping on to 5; the small apico-ventral spots absent; a pair of small, semi-oval, golden-yellow spots laterally at apex of 6; 7-8 narrow, long, cylindrical, resembling 6, but without basal spots; 9 very short, blackish; *appendages* black at bases, golden apically, inferior shovel-shaped, hairy, as in Text-fig. 2, A.

Wings with black venation except basal two-thirds of C, bases of anal veins, and many cross-veins, which are pale straw-colour. In forewing, a black, longitudinal



Text-fig. 1.*



Text-fig. 2.*

band runs from base to pterostigma, enclosing Sc and R; the costal cross-veins towards pterostigma also outlined in black. *Pterostigma* with a straw spot covering five veinlets, and bordered basally with black; apex of wing beyond pterostigma strongly blackened, the basal border of this black patch oblique, nearly a straight line. In hindwing, the pattern is similar, but the longitudinal, black band fills the whole costal and subcostal spaces.

♀. Total length 45, abdomen 30, forewing 50 by 10.5 wide, hindwing 46 by 8.5 mm. wide.

Differs from ♂ by the broader wings: the antennæ black, with

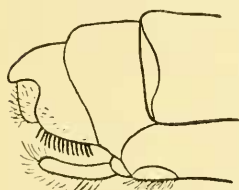
* For legends of Text-figs. 1-3, see p. 69.

fine, yellow rings; the abdomen much shorter, more cylindrical, without any humps, the latero-basal spots less rounded, rather subtriangular, the apico-ventral spots distinct, larger than in ♂; the apex as in Text-fig.3,A. Prothorax of ♀ has a narrow, raised, transverse ridge, bright yellow.

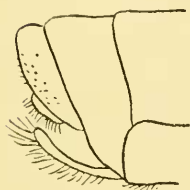
Hab.—Waroona, W.A. A number of specimens taken by Mr. G. F. Berthoud, in January-February, 1913-1915. Also a single, fine ♀ taken at Yallingup, W.A., by Mr. R. E. Turner, on January 7th, 1914.

Types, ♂♀, in Coll. Tillyard (Waroona, W.A.; G. F. Berthoud; ♂, January 6th, 1914; ♀, February 24th, 1914).

This fine species differs from *S. costalis* Newman (Eastern



A.



B.

Text-fig.3.

is shown in Text-fig.1, B. The appendages of *S. costalis* ♂ are black, and less complicated than those of *S. dromedaria* (cf. Text-fig.2, A and B).

The females of the two species are less easy to separate, but *S. dromedaria* ♀ may be distinguished by the shorter antennæ, the black costal space of the hindwing, the straighter, inner edge of the black, apical patch, and by the different form of the apex of the abdomen (cf. Text-fig.2, A and B).

Australia) in the following points. In the ♂ of *S. costalis*, the wings are broader, and the black, longitudinal streak does not include the costal space, but only touches the bases of the costal cross-veins. Also, in all four wings of *S. costalis*, the basal border of the apical, black patch is irregular. The antennæ of *S. costalis* are longer, and ringed with yellow; the head, thorax, and segments 3-4 of abdomen much less hairy, the abdomen much shorter, stouter, and with *only a single hump*, placed dorsally on 4. The golden spots of the abdomen in *S. costalis* are confined to segments 5-7 laterally, 4-6 ventrally; the only, large, round spot is placed basally on segment 5. This pattern

Text-fig. 1.—Lateral view of colour-pattern of abdomen in *Stilbopteryx*.
A. *S. dromedaria*, n.sp., ♂. B. *S. costalis* Newman, ♂; ($\times 1.5$).

Text-fig. 2.—Lateral view of anal appendages in males of *Stilbopteryx* (much enlarged). A. *S. dromedaria*, n.sp., ♂. B. *S. costalis* Newman, ♂; ($\times 6$).

Text-fig. 3.—Lateral view of end of abdomen in female of *Stilbopteryx* (much enlarged). A. *S. dromedaria*, n.sp., ♀. B. *S. costalis* Newman, ♀; ($\times 6$).

EXPLANATION OF PLATES I.-VI.

Plate i.

Fig. 1.—*Euporismus albatrox*, g. et sp. n.; ($\times 3$).

Fig. 2.—*Acanthaclisis peterseni*, n.sp.; ($\times 1.3$).

Plate ii.

Fig. 3.—*Periclystus aureolatus*, n.sp.; ($\times 3$).

Fig. 4.—*Protoplectron eremita*, n.sp.; ($\times 2.5$).

Fig. 5.—*Protoplectron longitudinale*, n.sp.; ($\times 1.7$).

Plate iii.

Fig. 6.—*Dendroleon dumigani*, n.sp.; ($\times 2.5$).

Fig. 7.—*Dendroleon lambda*, n.sp.; ($\times 3$).

Fig. 8.—*Glenoleon berthoudi*, n.sp.; ($\times 2.5$).

Plate iv.

Fig. 9.—*Glenoleon aurora*, n.sp.; ($\times 2.7$).

Fig. 10.—*Brachyleon Darwini* (Banks); ($\times 2.5$).

Fig. 11.—*Gymnocnemis maculata*, n.sp.; ($\times 2.8$).

Plate v.

Fig. 12.—*Xantholeon helmsi*, g. et sp. n.; ($\times 2.8$).

Fig. 13.—*Stenoleon fieldi*, g. et sp. n.; ($\times 2.8$).

Fig. 14.—*Alloformicaleon waterhousei*, n.sp.; ($\times 3.3$).

Plate vi.

Fig. 15.—*Myrmeleon loweri*, n.sp.; ($\times 2.5$).

Fig. 16.—*Alloformicaleon hyalinus*, n.sp.; ($\times 2.5$).

Fig. 17.—*Distoleon nigrosignatus*, n.sp.; ($\times 2.5$).

N.B.—The figures are made from the type-specimens, but, where the setting of the specimen has been irregular, the wings have been orientated so as to conform to a single plan, and the abdomen straightened out where necessary.